

interest and found that elephants fed on the bark of this tree albeit rarely. Surprisingly, they neither touched the fruits nor destroyed the trees. This visual observation was substantiated by local tribals who said they had never seen elephants feeding greedily on the fruits of this species but had seen them feeding on the bark of the species on rare occasions. The macro-component analysis of the dung samples never showed remnants of the fruit of *D. aurea*.

Is there a change in the food selection of elephants over a span of 65 years? H.H. Haines never visited Dalma Sanctuary, but his observations were made in other parts of Bihar and in Orissa. The logical explanation to this behaviour could be that the density of this species must have gone low over the years and as a result it was excluded from the dietary of elephants. Presently, this species is common in the Sanctuary and its fruit is relished by the tribals and I enjoyed it equally!

It would be interesting to know whether elephants feed on the bark and the fruit of this tree in other elephant areas.

Incidentally, H.H. Haines quotes Hamilton's observations about the size of the fruit of this species that the fruit was as big as a large-sized apple. Haines notes that he never saw the fruit as large but much smaller. I found that in Dalma Sanctuary and other forests in South Bihar, the fruit is less than half the size of an Apple, golden-yellow in colour, and very sweet when ripe. Thus, my observations support Haines. In that case, in which areas of its distribution, are the apple-sized fruits of *Dillenia aurea* found?

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REFERENCES

GADGIL, MADHAV & V.M. MEHER-HOMJI (1986): Localities of great Indian significance. Acad. Sci. (Anim. Sci./Plant Sci.) suppl.: 165-180.
HAINES, H.H. (1910): A forest flora of Chhotanagpur including

Gangpur and the Santhal Parganahs. Superintendent, Government Printing, Calcutta.
HAINES, H.H. (1925): The botany of Bihar and Orissa. Six parts. Adlard & Son and West Newman Ltd., London.

8. TAXONOMY OF YAK: *BOS (POEPHAGUS) GRUNNIENS*

Yak, a mammal of economic importance, living at high altitude (3500 - 6000 m above msl) in the Himalayas, Kun Lun, Pamirs, Tien Shan and Altai, has been known as (*Bos grunniens* or *Poephagus grunniens*), for nearly two and half centuries. Its adaptation to life in gelid climates has always drawn considerable interest among naturalists and biologists. Remoteness, inaccessibility of the habitat, political restrictions and religious strictures preventing excavations in the hometract (Palaentological study), had, so far, delayed the establishment of its correct nomenclature. Recently, some studies have been conducted to establish its correct nomenclature and to ascertain the domestication process of yak and to establish its ancestry. Incidentally, the ancestry for most of the

other domesticated animals has already been established scientifically. In this communication, an effort is made to record observations on the taxonomy of the yak, made by different scientists.

Linnaeus (1758) named yak as *Bos grunniens*. He included the yak in the cattle group (*Bos*), possibly due to its likeness and nearness to cattle and gave the species name *grunniens*, or the grunting ox. Gmelin in 1760, termed yak as '*Vacca grunniens villora, Cauda equina*' because of its grunting sound and horse like tail. Buffon, another naturalist of the 18th century, contemporary to Gmelin, described in 1767 the yak in a similar manner and called it, a cow of '*Tartary*'. Almost a decade later Pallas, called yak as horsetailed buffalo (Bonnemaire 1984). Smith

(1827) classified the yak as "*B. poephagus* of Aelian, the *B. grunniens* of Pallas." Aelianus Claudius (170-235 A.D.) named yak as *Poephagus* which means grass eater. The observations of Smith were based on physical characters and did not cite any comparison of skull, or skeleton. Incidentally, Linnaeus also did not cite any discussion or comparison of yak before placing it in the genus *Bos*. Jerdon (1836) cited yak as *Bison poephagus* based on its physical appearance on a similar fashion as '*Poephagus* of Aelian and *Bos grunniens* of Pallas.'

The taxonomical names of yak were based mostly on its physical characters and its nearness to *Bos* or to *Bison*. Gray (1843, 1846 and 1852) listed yak as *Poephagus grunniens* after conducting a detailed study of the skull and skeleton. According to him the key difference between the *Bison* and *Bos* were in the formation and placement of the intermaxillaries, which are — "short, triangular, acute behind and not reaching the nasal, being gradually shorter in proportion from *Poephagus* to *Bison*. In *Bos* they are elongated reaching the suture between the nasal and the cheek bone." Lydekker (1898) classified yak as *Bos grunniens* based on the arrangement of premaxillaries, intermaxillaries and nasal bone though he observed yak to be closer to *Bison* than *Bos*. In an earlier work (Lydekker 1876) recorded yak as *Bison* or *Poephagus grunniens*.

Jerdon (1874), on the line of Georges Cuvier divided sub-family Bovinae into three groups, the Bisontine (*Bison*, *Moschatus* and *Poephagus*), the Taurine (*Bos*; hump and humpless cattle and *Gavaeus* flat horn cattle); and Buboline (buffaloes) probably on the observations recorded by Gray and other workers in favour of *Poephagus*. Incidentally reports published in India in 1924 gave yak as *Poephagus grunniens* L., *Bos poephagus* Smith and *Poephagus grunniens* Gray (Annon. 1924). Olsen (1991) also opined, that probably very few, if at all any, skeletal materials were available for the earlier works of the 17th and 18th centuries for detailed comparisons. Olsen (1991) on the basis of observations from 27 skulls in museum collections in the United States, USSR, England and People's Republic of China is in agreement with Allen (1940) who classified yak as *Poephagus grunniens* and further states "the species *grunniens* be re-established in the genus *Poephagus*, rather than be included in the present genus *Bos*".

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REFERENCES

- ANNON. (1924): BNHS Mammal Survey of India., Burma and Ceylon. *J. Bombay Nat. Hist. Soc.*, Vol. XXIX, 424.
- ALLEN, G.M. (1940): The Mammals of China and Mongolia. Amer. Mus. Nat. Hist., New York. pp. 620.
- BONNEMAIRE, J. (1984): Yak. Evaluation of Domesticated Animals. Mason I. L. (Edi.), Longman, London. pp. 452.
- GRAY, J.E. (1843): List of Mammals in the British Museum. London. 153.
- GRAY, J.E. (1846): Annual Magazine, Natural History. Vol. XVIII. British Mus., London. 18: 233.
- GRAY, J.E. (1852): Catalog of Mammals. British Mus., London. 3: 16-17.
- JARDINE, W. (1836): Naturalist's Library — Mammals, Vol. IV, Part 2, London. pp. 264.
- JERDON, T.C. (1874): A Hand Book of the Mammals of India. Reprinted 1989, Mittal Pub., New Delhi-300.
- LINNAEUS, C. (1758): System Naturae per Regna Tria Naturae, Secundum Classes, Ordines, Geneva, Species, Editio Decima, Reformata, Vol. I, Laurenti Salvii, Stockholm. pp. 824.
- LYDEKKER, R. (1874): Indian Tertiary and Post-Tertiary Vertebrata, Vol. 1.3 Mem Geol. Surv. India, Ser. X. 3 Crania of Ruminants from Indian Tertiaries. Geol. Surv. India. Calcutta. pp. 171.
- OLSEN, J. (1991): Confused Yak Taxonomy and Evidence of Domestication. Illinois State Museum Scientific Reports, Vol. 23, Spring Field.
- SMITH, C. H. (1827): Griffith's Animal Kingdom, Vol. IV. London.